SEQUENCE LISTING

<110> FOWLKES, Dana M.
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      MANFREDI, John
      KLEIN, Christine
      MURPHY, Andrew J.
      PAUL, Jeremy
      TRUEHEART, Joshua

<120> YEAST CELLS ENGINEERED TO PRODUCE PHEROMONE SYSTEM PROTEIN SURROGATES AND
      USES THEREFOR

<130> CPI-012CP4DV

<140> 09/258600
<141> 1999-02-26

<150> 08/461598
<151> 1995-06-05

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Ala Leu Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
            20   25   30
Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
            35   40   45
Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
        50   55   60
Phe Ile Asn Thr Thr Ile Ala Ser Ile Ala Ala Lys Glu Glu Gly Val
65   70   75   80
Ser Leu Asp Lys Arg Glu Ala Glu Ala
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            20                  25                  30
Met Tyr Lys Arg Glu Ala Asp Ala Glu Ala Trp His Trp Leu Gln Leu
        35                  40                  45
Lys Pro Gly Gln Pro Met Tyr Lys Arg Glu Ala Asp Ala Glu Ala Trp
        50                  55                  60
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Lys Glu Glu Gly Val Ser Leu Leu
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knnknnktga tcatccg                                               77


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Xaa Xaa Xaa



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Glu Lys Lys Asp Asn Tyr Ile Ile Lys Gly Val Phe Trp Asp Pro Ala
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Cys Val Ile Ala
            35



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49, 51, 52, 54, 55, 57, 58
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cggatgatca                                                            10

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<210> 23
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<400> 23
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<400> 33
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<400> 34
Arg Asn Ser Ser Ser Ser Gly Ser Ser Gly Ala Gly Gln Lys Arg Glu
  1               5                  10                  15
Ala Glu Ala Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr
             20                  25                  30


<210> 35
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<400> 36
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ttaagcgtga ggcagaagct tatcgata   28

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gtctgtgacg c   71

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<400> 40
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<210> 41
<211> 56
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tgg cat tgg ttg cag cta aaa cct ggc caa cca atg tac   39
Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr
 1   5   10

<210> 43
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<213> Saccharomyces cerevisiae

<400> 43
Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr
 1   5   10

<210> 44
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<400> 44
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<210> 45
<211> 69
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cgcatccag   69

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 1   5   10

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<400> 47
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 1   5   10

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 1   5   10

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Trp His Trp Leu Glu Leu Met Pro Gly Gln Pro Leu Tyr
 1   5   10

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Trp His Trp Met Glu Leu Arg Pro Gly Gln Pro Met Tyr
 1   5   10

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Trp His Trp Met Glu Leu Arg Pro Gly Gln Pro Met Tyr
 1   5   10

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tat gct ctg ttt gtt cat ttt ttt gat att ccg          33
Tyr Ala Leu Phe Val His Phe Phe Asp Ile Pro
 1               5                   10


<210> 53
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<400> 53
Tyr Ala Leu Phe Val His Phe Phe Asp Ile Pro
 1               5                   10


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Phe Lys Gly Gln Val Arg Phe Val Val Leu Ala

 1               5                   10


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Phe Lys Gly Gln Val Arg Phe Val Val Leu Ala
 1               5                   10


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 1   5   10

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<400> 57
Leu Met Ser Pro Ser Phe Phe Phe Leu Pro Ala
 1   5   10

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ggggtaccaa taggttcttt cttagg   26

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ccccttaagc gtgaggcaga agctactctg caaaagaaga tc                  42

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gaagatcttc agcggccgag ttgcatgtc                                 29

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<400> 66
gatatattaa ggtaggaaac catggggtgt acagtgag                       38

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<211> 34
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<400> 69
cccgaatcca ccaatttctt tacg                                         24


<210> 70
<211> 27
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<400> 70
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gggctcgagc cttcttagag cagctcgtac                                   30


<210> 74
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<210> 80
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<400> 81
gaaacaatgg atccacttct tac   23

<210> 82
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Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln
            20   25   30
Leu Glu Lys Gln Arg Asp Lys Asn Glu Ile Lys Leu Leu Leu Leu Gly
        35   40   45
Ala Gly Glu Ser Gly Lys Ser Thr Val Leu Lys Gln Leu Lys Leu Leu
    50   55   60
His Gln
65

<210> 83
<211> 65
<212> PRT
<213> Saccharomyces cerevisiae

<400> 83
Met Gly Cys Leu Gly Thr Ser Lys Thr Glu Asp Gln Arg Asn Glu Glu
1   5   10   15
Lys Ala Gln Arg Glu Ala Asn Lys Lys Ile Glu Lys Gln Leu Gln Lys
            20   25   30
Asp Lys Gln Val Tyr Arg Ala Thr His Arg Leu Leu Leu Leu Gly Ala
        35   40   45
Gly Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Arg Ile Leu His
    50   55   60
Val
65

<210> 84
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<213> Saccharomyces cerevisiae

<400> 84
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Met Gly Cys Thr Val Ser Ala Glu Asp Lys Ala Ala Ala Glu Arg Ser
1               5                   10                  15
Lys Met Ile Asp Lys Asn Leu Arg Glu Asp Gly Glu Lys Ala Ala Arg
            20                  25                  30
Glu Val Lys Leu Leu Leu Leu Gly Ala Gly Glu Ser Gly Lys Ser Thr
            35                  40                  45
Ile Val Lys Gln Met Lys Ile Ile His Glu
    50                  55
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<400> 85
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1               5                   10                  15
Lys Met Ile Asp Arg Asn Leu Arg Glu Asp Gly Glu Lys Ala Ala Lys
            20                  25                  30
Glu Val Lys Leu Leu Leu Leu Gly Ala Gly Glu Ser Gly Lys Ser Thr
            35                  40                  45
Ile Val Lys Gln Met Lys Ile Ile His Glu
    50                  55
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<212> PRT
<213> Saccharomyces cerevisiae

<400> 86
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Met Ala Arg Ser Leu Thr Trp Arg Cys Cys Pro Trp Cys Leu Thr Glu
1               5                   10                  15
Asp Glu Lys Ala Ala Ala Arg Val Asp Gln Glu Ile Asn Arg Ile Leu
            20                  25                  30
Leu Glu Gln Lys Lys Gln Asp Arg Gly Glu Leu Lys Leu Leu Leu Leu
            35                  40                  45
Gly Pro Gly Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile
    50                  55                  60
Ile His Gly
65
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<210> 87
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<213> Saccharomyces cerevisiae

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<400> 87
Met Gly Cys Thr Val Ser Thr Gln Thr Ile Gly Asp Glu Ser Asp Pro
 1               5                  10                  15
Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln
            20                  25                  30
Leu Glu Lys Gln Arg Asp Lys Asn Glu Arg Lys Leu Leu Leu Leu Gly
        35                  40                  45
Ala Gly Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Arg Ile Leu
    50                  55                  60
His Val
65
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<400> 88
Met Gly Cys Thr Val Ser Thr Gln Thr Ile Gly Asp Glu Ser Asp Pro
 1               5                  10                  15
Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln
            20                  25                  30
Leu Glu Lys Gln Arg Asp Lys Asn Glu Val Lys Leu Leu Leu Leu Gly
        35                  40                  45
Ala Gly Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Lys Ile Ile
    50                  55                  60
His Glu
65
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<210> 89
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Met Gly Cys Thr Val Ser Thr Gln Thr Ile Gly Asp Glu Ser Asp Pro
 1               5                  10                  15
Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln
            20                  25                  30
Leu Glu Lys Gln Arg Asp Lys Asn Glu Val Lys Leu Leu Leu Leu Gly
        35                  40                  45
Ala Gly Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Lys Ile Ile
    50                  55                  60
His Glu
65
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Met Gly Cys Thr Val Ser Thr Gln Thr Ile Gly Asp Glu Ser Asp Pro
 1               5                  10                  15
Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln
             20                  25                  30
Leu Glu Lys Gln Arg Asp Lys Asn Glu Leu Lys Leu Leu Leu Leu Gly
         35                  40                  45
Pro Gly Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile Ile
     50                  55                  60
His Gly
65
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<221> CDS
<222> (1)...(39)


<400> 91
tgg cat tgg ttg cag cta aaa cct ggc cag cct atg tac          39
Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr
 1               5                  10


<210> 92
<211> 13
<212> PRT
<213> Saccharomyces cerevisiae

<400> 92
Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr
 1               5                  10


<210> 93
<211> 39
<212> DNA
<213> Saccharomyces cerevisiae


<221> CDS
<222> (1)...(39)


<400> 93
tgg cat tgg ttg tcc ttg tcg ccc ggg cag cct atg tac          39
Trp His Trp Leu Ser Leu Ser Pro Gly Gln Pro Met Tyr
 1               5                  10


<210> 94
<211> 13
<212> PRT
<213> Saccharomyces cerevisiae

<400> 94
Trp His Trp Leu Ser Leu Ser Pro Gly Gln Pro Met Tyr
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    1               5                    10
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<210> 95
<211> 39
<212> DNA
<213> Saccharomyces cerevisiae


<221> CDS
<222> (1)...(39)


<400> 95
tgg cat tgg ttg tcc ctg gac gct ggc cag cct atg tac              39
Trp His Trp Leu Ser Leu Asp Ala Gly Gln Pro Met Tyr
 1               5                    10


<210> 96
<211> 13
<212> PRT
<213> Saccharomyces cerevisiae

<400> 96
Trp His Trp Leu Ser Leu Asp Ala Gly Gln Pro Met Tyr
 1               5                    10


<210> 97
<211> 39
<212> DNA
<213> Saccharomyces cerevisiae


<221> CDS
<222> (1)...(39)


<400> 97
tgg cat tgg ttg acc ttg atg gcc ggg cag cct atg tac              39
Trp His Trp Leu Thr Leu Met Ala Gly Gln Pro Met Tyr
 1               5                    10


<210> 98
<211> 13
<212> PRT
<213> Saccharomyces cerevisiae

<400> 98
Trp His Trp Leu Thr Leu Met Ala Gly Gln Pro Met Tyr
 1               5                    10


<210> 99
<211> 39
<212> DNA
<213> Saccharomyces cerevisiae
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<221> CDS
<222> (1)...(39)


<400> 99
tgg cat tgg ttg cag ctg tcg gcg ggc cag cct atg tac          39
Trp His Trp Leu Gln Leu Ser Ala Gly Gln Pro Met Tyr
 1               5                   10


<210> 100
<211> 13
<212> PRT
<213> Saccharomyces cerevisiae

<400> 100
Trp His Trp Leu Gln Leu Ser Ala Gly Gln Pro Met Tyr
 1               5                   10


<210> 101
<211> 39
<212> DNA
<213> Saccharomyces cerevisiae


<221> CDS
<222> (1)...(39)


<400> 101
tgg cat tgg ttg agg ttg cag tcc ggc cag cct atg tac          39
Trp His Trp Leu Arg Leu Gln Ser Gly Gln Pro Met Tyr
 1               5                   10


<210> 102
<211> 13
<212> PRT
<213> Saccharomyces cerevisiae

<400> 102
Trp His Trp Leu Arg Leu Gln Ser Gly Gln Pro Met Tyr
 1               5                   10


<210> 103
<211> 39
<212> DNA
<213> Saccharomyces cerevisiae


<221> CDS
<222> (1)...(39)


<400> 103
tgg cat tgg ttg cgc ttg tcc gcc ggg cag cct atg tac          39
Trp His Trp Leu Arg Leu Ser Ala Gly Gln Pro Met Tyr
 1               5                   10
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<210> 104
<211> 13
<212> PRT
<213> Saccharomyces cerevisiae

<400> 104
Trp His Trp Leu Arg Leu Ser Ala Gly Gln Pro Met Tyr
 1               5                   10


<210> 105
<211> 39
<212> DNA
<213> Saccharomyces cerevisiae


<221> CDS
<222> (1)...(39)


<400> 105
tgg cat tgg ttg tcg ctc gtc ccg ggg cag cct atg tac                39
Trp His Trp Leu Ser Leu Val Pro Gly Gln Pro Met Tyr
 1               5                   10


<210> 106
<211> 13
<212> PRT
<213> Saccharomyces cerevisiae

<400> 106
Trp His Trp Leu Ser Leu Val Pro Gly Gln Pro Met Tyr
 1               5                   10


<210> 107
<211> 39
<212> DNA
<213> Saccharomyces cerevisiae


<221> CDS
<222> (1)...(39)


<400> 107
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Trp His Trp Leu Ser Leu Tyr Pro Gly Gln Pro Met Tyr
 1               5                   10


<210> 108
<211> 13
<212> PRT
<213> Saccharomyces cerevisiae

<400> 108
Trp His Trp Leu Ser Leu Tyr Pro Gly Gln Pro Met Tyr
 1               5                   10
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<210> 109
<211> 39
<212> DNA
<213> Saccharomyces cerevisiae


<221> CDS
<222> (1)...(39)


<400> 109
tgg cat tgg ttg cgg ctg cag ccc ggg cag cct atg tac          39
Trp His Trp Leu Arg Leu Gln Pro Gly Gln Pro Met Tyr
 1               5                   10


<210> 110
<211> 13
<212> PRT
<213> Saccharomyces cerevisiae

<400> 110
Trp His Trp Leu Arg Leu Gln Pro Gly Gln Pro Met Tyr
 1               5                   10


<210> 111
<211> 62
<212> PRT
<213> Saccharomyces cerevisiae



<400> 111
Arg Ile Asp Thr Thr Gly Ile Thr Glu Thr Glu Phe Asn Ile Gly Ser
 1               5                   10                  15
Ser Lys Phe Lys Val Leu Asp Ala Gly Gly Gln Arg Ser Glu Arg Lys
                20                  25                  30
Lys Trp Ile His Cys Phe Glu Gly Ile Thr Ala Val Leu Phe Val Leu
                35                  40                  45
Ala Met Ser Glu Tyr Asp Gln Met Leu Phe Glu Asp Glu Arg
    50                  55                  60


<210> 112
<211> 62
<212> PRT
<213> Saccharomyces cerevisiae



<400> 112
Arg Val Leu Thr Ser Gly Ile Phe Glu Thr Lys Phe Gln Asn Asp Lys
 1               5                   10                  15
Val Asn Phe His Met Phe Asp Val Gly Gly Gln Arg Asp Glu Arg Lys
                20                  25                  30
Lys Trp Ile Gln Cys Phe Asn Asp Val Thr Ala Ile Ile Phe Val Val
                35                  40                  45
Ala Ser Ser Ser Tyr Asn Met Val Ile Arg Glu Asp Asn Gln
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        50                    55                    60


<210> 113
<211> 62
<212> PRT
<213> Saccharomyces cerevisiae



<400> 113
Arg Val Lys Thr Thr Gly Ile Val Glu Thr His Phe Thr Phe Lys Asp
1               5                   10                  15
Leu His Phe Lys Met Phe Asp Val Gly Gly Gln Arg Ser Glu Arg Lys
            20                  25                  30
Lys Trp Ile His Cys Phe Glu Gly Val Thr Ala Ile Ile Phe Cys Val
        35                  40                  45
Ala Leu Ser Ala Tyr Asp Leu Val Leu Ala Asp Glu Glu Met
    50                  55                  60


<210> 114
<211> 62
<212> PRT
<213> Saccharomyces cerevisiae



<400> 114
Arg Val Lys Thr Thr Gly Ile Val Glu Thr His Phe Thr Phe Lys Asp
1               5                   10                  15
Leu Tyr Phe Lys Met Phe Asp Val Gly Gly Gln Arg Ser Glu Arg Lys
            20                  25                  30
Lys Trp Ile His Cys Phe Glu Gly Val Thr Ala Ile Ile Phe Cys Val
        35                  40                  45
Ala Leu Ser Asp Tyr Asp Leu Val Leu Ala Glu Asp Glu Glu
    50                  55                  60


<210> 115
<211> 62
<212> PRT
<213> Saccharomyces cerevisiae



<400> 115
Arg Val Lys Thr Thr Gly Ile Val Glu Thr His Phe Thr Phe Lys Asn
1               5                   10                  15
Leu His Phe Arg Leu Phe Asp Val Gly Gly Gln Arg Ser Glu Arg Lys
            20                  25                  30
Lys Trp Ile His Cys Phe Glu Asp Val Thr Ala Ile Ile Phe Cys Asn
        35                  40                  45
Ala Leu Ser Gly Tyr Asp Gln Val Leu His Glu Asp Glu Thr
    50                  55                  60


<210> 116
<211> 62
<212> PRT
<213> Saccharomyces cerevisiae
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<400> 116
Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Glu Asn
1   5   10   15
Ile Ile Phe Lys Met Val Asp Ala Gly Gly Gln Arg Ser Glu Arg Lys
            20   25   30
Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe Leu Val
        35   40   45
Ala Leu Ser Glu Tyr Asp Gln Cys Leu Glu Glu Asn Asn Gln
    50   55   60

<210> 117
<211> 62
<212> PRT
<213> Saccharomyces cerevisiae

<400> 117
Arg Met Pro Thr Thr Gly Ile Asn Glu Tyr Cys Phe Ser Val Gln Lys
1   5   10   15
Thr Asn Leu Lys Ile Val Asp Ala Gly Gly Gln Arg Ser Glu Arg Lys
            20   25   30
Lys Trp Ile His Cys Phe Glu Asn Ile Ile Ala Leu Ile Tyr Leu Ala
        35   40   45
Ser Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Ser Asp Asn
    50   55   60

<210> 118
<211> 25
<212> DNA
<213> Saccharomyces cerevisiae

<400> 118
agcttctgcc tcacgcttaa gtagc   25

<210> 119
<211> 26
<212> DNA
<213> Saccharomyces cerevisiae

<400> 119
gttgtccttc ttttcactcg agtacc   26

<210> 120
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 120
Leu Leu Leu Leu Gly Ala Gly Glu Ser Gly
 1   5   10

<210> 121
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> FRAGMENT

<400> 121
Leu Leu Leu Leu Gly Ala Gly Glu
 1   5

<210> 122
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> FRAGMENT

<400> 122
Gln Ala Arg Lys Leu Gly Ile Gln
 1   5

<210> 123
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> FRAGMENT

<400> 123
Leu Ile His Glu Asp Ile Ala Lys Ala
 1   5

<210> 124
<211> 5
<212> PRT
<213> Saccharomyces cerevisiae

<400> 124
Asp Val Gly Gly Gln
 1   5

<210> 125
<211> 7

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<212> PRT
<213> Artificial Sequence

<220>
<223> FRAGMENT

<400> 125
Ser Ser Gly Ala Gly Lys Arg
 1               5


<210> 126
<211> 69
<212> DNA
<213> Artificial Sequence

<220>
<223> FRAGMENT

<400> 126
gacctacgct tctgagtcga accgtaacca acgtcgattt tggaccggtt ggttacatga 60
ctagtaggc                                                         69
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